

Remarks:

The Decision of the Board of Patent Appeals and Interferences dated March 31, 2010, has been received and carefully reviewed. Claims 1, 16, 17 and 21 have been amended to overcome the Appeal Board rejection, and a request for reopening prosecution is requested. It is submitted that, by this amendment all bases of rejection and objection are traversed and overcome. Upon entry of this amendment, claims 1-23 remain in the application. Reconsideration of the claims is respectfully requested.

Claims 1, 16, 17 and 21 stand rejected under 35 U.S.C. 102(b), alternatively under 35 U.S.C. 103(a) in view of Jones (U.S. Patent 3,303,233). The new ground of rejection is based upon the adjacent homologous compound of propylene tetramer, i.e. propylene trimer as being a lightly branched olefin, as defined by the 703 Specification. Claims 1, 16, 17 and 21 have been amended, to exclude the propylene trimer. However, as will be explained below, oligomers of propylene are especially bad for detergents, including the propylene trimer. The first issue is the interpretation of lightly branched alkyl benzene vs. linear alky-benzene. A linear olefin, having one double bond anywhere in the olefin, when alkylating attaches to the benzene group at one of the carbons where the double bond is positioned. In alkylation, it preferentially attaches at the more inner carbon of the two carbons connected by the double bond. This does not create a branched alkylbenzene as defined in the specification, but is a linear alkylbenzene (page 4, line 13 to page 5, line 7), and is reinforced in the Jones reference, where in an LAB is produced in the example 1, with a structure shown in col. 11, line 5, with the linear alkyl group having two linear segments, R1 and R2, extending from the attached carbon. In cases where the olefin is an 1-olefin, R1 can be a methyl group. This is also stated in col 3, line 66 to col 4, line 19, and where Jones states "will produce a phenyl-substituted secondary alkane which both of the alkyl chains attached to the secondary carbon atom of the resulting alkylate are straight chain groups." The second issue is that the Jones reference teaches going from branched alkylbenzenes (BABs) to linear alkyl benzenes (LABs) and does not suggest that lightly branched alkylbenzenes are acceptable. The Jones reference came from the realization that branched alkylbenzenes did not biodegrade, and that linear ones did. Jones also states "These isomers, if converted along with the normal paraffins to their olefin analogs, do not exclusively yield the desired alkylates bearing a straight chain nuclear alkyl substituent or a branched chain group containing two branches, each of straight chain structure. Consequently, in order to produce alkylate products containing alkyl

groups of maximum linearity and the most advantageous properties insofar as its biodegradability is concerned the paraffinic fraction from which the olefin alkylating agent is prepared must be subject to a suitable separation procedure which isolates the desired normal components from the mixture of paraffin isomers and homologs.” (col. 4, lines 56-68) Subsequently, Jones discusses the necessary separation process (col. 4, line 69 to col. 5, line 4) where Jones states “certain molecular sieves have sufficient selectivity to provide product streams of 99+ percent normal paraffin purity.” To this end, the selection of molecular sieves, the choice of which consists of molecular sieves containing sufficiently small pores, “of about 5 Angstrom units in cross-sectional diameter which are of sufficient size to permit the entry of normal aliphatic compounds having four or more carbon atoms, but are not of sufficient size to permit the entry of branched chain or cyclic compounds.” (col. 5, lines 8-12) This is all about the production of linear alkanes for the production of LABs.

The new grounds of rejection states: “The propylene tetramer has five primary carbon atoms (-CH₃ groups). The adjacent homologous compound, i.e. the propylene trimer, would have one less primary carbon atom, and hence only four primary carbon atoms. Thus, the propylene trimer is a lightly branched olefin, as defined by the 703 Specification. A person having ordinary skill in the art would have expected such a lightly branched olefin to react with benzene and, upon sulfonation, to provide a useful surfactant. Those reasonable expectations of success render claims to the modified alkyl benzene compositions and to the modified sulfonated alkylbenzene compositions covered by the independent claims obvious in view of Jones.” (page 7 of Appeal decision) However, Jones description of propylene tetramers is listed in the example 1 (col. 11, lines 22-24), for the purpose of showing that the propylene tetramer is a bad surfactant. While it is a “useful” surfactant from the standpoint of a detergent, it is a “bad” surfactant from the biodegradability as shown in Table I. Jones states “The sample of detergent prepared from the branched chain (tetramer) alkylate remains active (i.e., produced foam) even after 108 hours.” One skilled in the art would see that, although, the oligomer can be used for the production of a detergent, it would be readily apparent that the results, presented in Table I of Jones, show that one wants to avoid branching if one is interested in an improved biodegradability for the detergent. Jones admits this produces a good detergent (col. 11, lines 56-61), but discusses why it is bad in the volumes of foam produced (col 12. lines 23-30). The purpose of Jones was to show that linear alkylbenzenes were needed, and that branched, either highly branched or lightly

branched, alkylbenzenes were not good. Improved biodegradability (page 6, lines 13-25 of the specification) is discussed, and subsequent knowledge acquired since Jones' reference of 30 years ago indicates that not all branched alkylbenzenes are bad, and why lightly branched alkylbenzenes, or modified alkylbenzenes (MABs), were found to be good.

A third issue is the separation process. The present invention has a selection of molecular sieve that allows for the adsorption and separation of lightly branched alkanes from a hydrocarbon feedstream. This is different from Jones, as was stated above, selected a molecular sieve to specifically exclude all non-linear alkanes, including branched alkanes. The present invention provides for the separation of lightly branched alkanes, which are excluded in the Jones process. The molecular sieves chosen are to limit the adsorbed alkanes to have light branching, that is 2 to 4 methyl groups.

Therefore, it is submitted that Jones does not anticipate the present invention as presented in the amended claims 1, 16, 17 and 21, nor is it obvious from Jones that one would consider lightly branched alkylbenzenes. In addition, Jones does not teach the present separation process to recover lightly branched alkanes through the use of a molecular sieve that adsorbs lightly branched alkanes, nor is it obvious that one would select a molecular sieve that adsorbs compounds that Jones teaches to exclude. The present invention has found a process for producing a modified alkylbenzene using lightly branched alkanes that have specific characteristics, such that the product alkylaromatic compounds will produce a detergent having good biodegradability. Reconsideration is respectfully requested.

In summary, claims 1-23 remain in the application. Accordingly in view of the above amendments and remarks, applicants assert that claims 1-23 meet all statutory requirements and respectfully request allowance of all pending claims. If the Examiner believes it would expedite prosecution of the above identified application he is cordially invited to contact applicants' attorney at the below listed telephone number.

Respectfully submitted,



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